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# Annual Report 1978



**NASA-UK STAP: A TECHNOLOGY APPLICATIONS  
PROGRAM TO AID GOVERNMENT AND INDUSTRY IN  
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A Technology Applications Program to Aid  
Government and Industry in Kentucky



Center for Public Affairs  
Office for Research  
College of Business and Economics  
University of Kentucky  
Lexington, Kentucky



National Aeronautics and Space Administration/  
University of Kentucky—State Technology Applications Program  
109 Kinkead Hall/University of Kentucky  
Lexington, KY 40506  
Phone: (606) 258-4632

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## **TABLE OF CONTENTS**

<b>Background and Purpose</b> .....	<b>1</b>
<b>Program Objectives</b> .....	<b>2</b>
<b>Organizational Structure and Personnel</b> .....	<b>3</b>
<b>Operational Strategy</b> .....	<b>4</b>
<b>Outreach Activities</b> .....	<b>5</b>
<b>Program Achievements</b> .....	<b>6</b>
<b>Industry and Business</b> .....	<b>7</b>
<b>Operational Statistics</b> .....	<b>8</b>
<b>Financial Report</b> .....	<b>8</b>
<b>Future Directions</b> .....	<b>10</b>

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## Background and Purpose

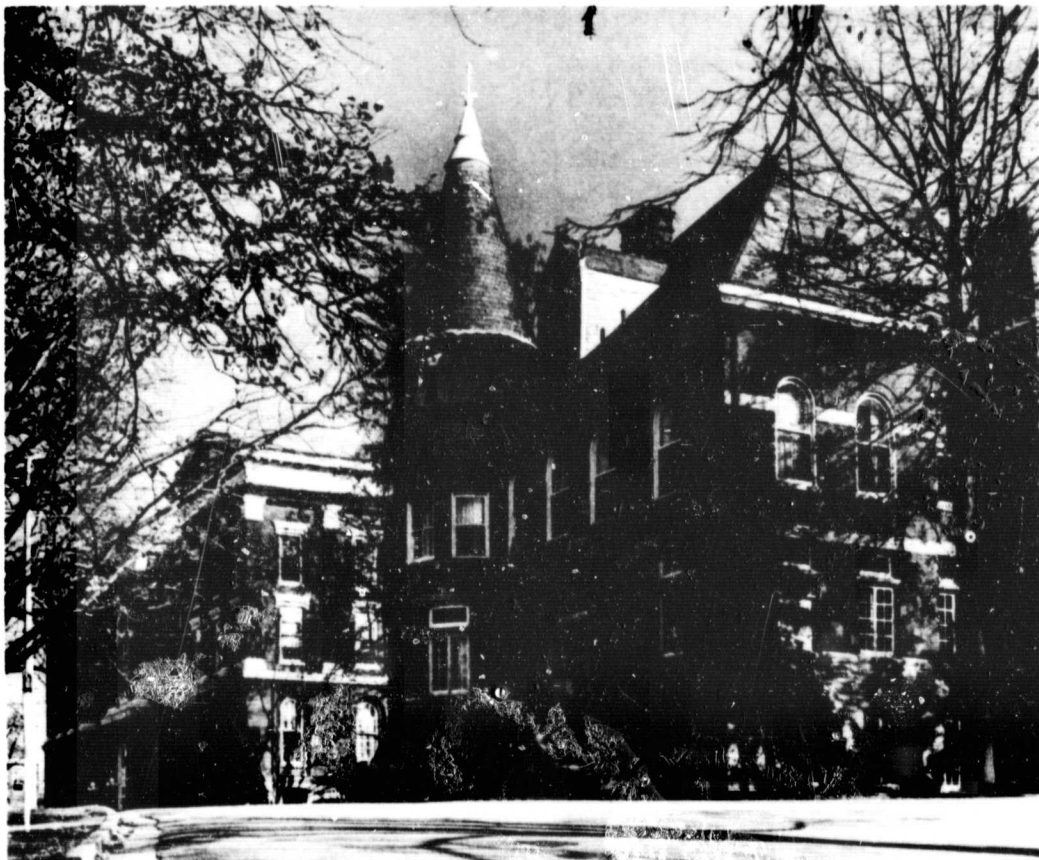
In recent years, federal funding of research and development has been growing rapidly and is now in excess of seven billion dollars annually. Unfortunately, in many cases, the full benefits of the research are not realized because the research findings are not transferred to potential users. If scientific and technical information is to become more widely used, there is

a need for a well-defined partnership between universities, government, and the business and industrial community to promote the transfer of technology.

In an effort to foster such a partnership, the Space Systems Program, administered by the National Aeronautics and Space Administration (NASA), has established information dissemination centers in cooperation with various universities throughout the country. The principal role of the centers is to foster a flow of technologies to the various sectors of the economy. In many cases, the technology transfer efforts of the centers have been highly successful, especially to business and industry. However, the transfer of technology to state and local units of government had met with limited success.

As a result, NASA felt that new stimuli and new approaches were needed in the public sector area. To insure such stimuli, NASA decided to establish a new center to develop strategies primarily in the public sector.

NASA selected the University of Kentucky, a land grant institution with a significant research dissemination and service role, as the site for the new program. The contract between NASA and the University of Kentucky establishing the program was signed in February 1977. The new program was officially named the National Aeronautics and Space Administration/University of Kentucky State Technology Applications Program (NASA/UK STAP). The program was administratively placed in the Center for Public Affairs, Office for Research, College of Business and Economics, because of the Center's public sector emphasis and experience in related programs.





# Program Objectives

NASA/UK STAP provides rapid access to scientific and technical knowledge from data bases and other information resources and promotes the transfer and practical application of this knowledge in Kentucky. In doing so, it meets the following objectives:

## Government Sector

- To demonstrate the effectiveness of transferring NASA technology to local governments, principally those serving rural populations with low per capita incomes.
- To demonstrate the effectiveness of transferring NASA technology to departments of state government.
- To acquire scientific and technical information for and disseminate it to governmental organizations within the Commonwealth.
- To develop awareness in the governmental sectors of the scope and magnitude of information available to them.
- To assist governmental organizations in clarifying their needs and identifying the appropriate technology.

## Industrial Sector

- To identify opportunities for using NASA technology in fragmented, low-technology industries, reduce industrial costs, improve productivity, and establish favorable climates for industrial growth.
- To utilize NASA innovations and to identify possible new product-line opportunities for industry in Kentucky.
- To help establish an industrial-economic climate that will encourage locations of new industries in Kentucky.



# Organizational Structure and Personnel

The NASA/UK State Technology Applications Program is an element of the Center for Public Affairs, College of Business and Economics, University of Kentucky. The Center was chosen to administer the program for the following reasons:

- The Center had established contacts with virtually all of the cities in Kentucky, most state agencies, and many businesses.
- The Center's administrative staff was experienced in working with other university colleges and personnel in interdisciplinary research and technical assistance efforts.
- The program emphasizes the transfer of technology to state and local government agencies, industries, and business.

As the Director of the Center for Public Affairs, Dr. Merlin M. Hackbart provides overall direction for the NASA/UK State Technology Applications Program. He is responsible for the coordination of the program and other Center activities, budget development and execution, and for technology transfer strategies. He also serves as liaison with NASA personnel regarding continuous program development.

William R. Strong, who formally served as Deputy Director of the Center for Public Affairs, is currently the Assistant Director of Technology Transfer and STAP Program Manager. He is responsible for managing the day-to-day operations of NASA/UK STAP. Mr. Strong assigns transfer agents to functional areas of government and industry for the purposes of analyzing potential applications of NASA and related technology and responding to client requests. In addition, he is responsible for managing the program office, supervising the staff, analyzing technology applications, and marketing this service.

The technology transfer agents are the program personnel responsible for coordinating specialized program areas and

interacting directly with public and private sector organizations. Each transfer agent possesses the experience and educational background necessary to work effectively within his program element.

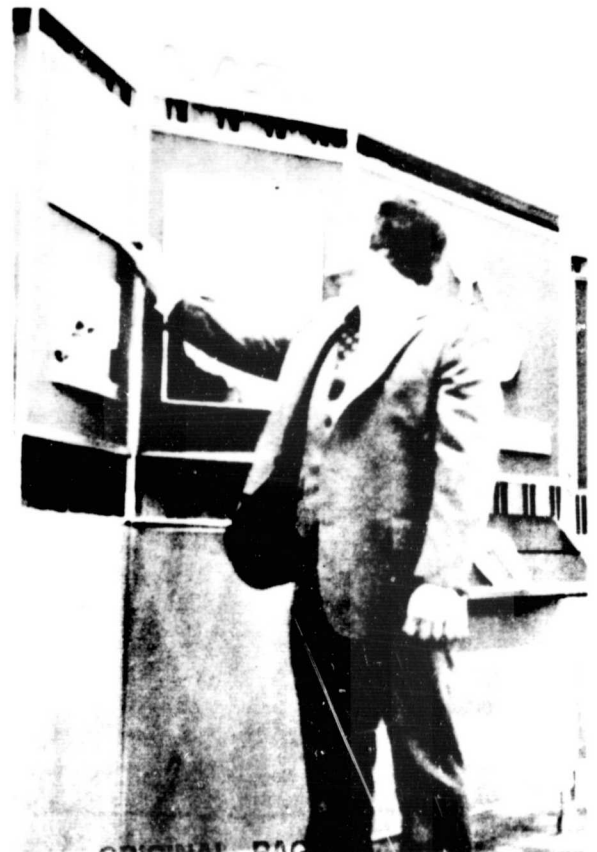
Lawrence A. Floro, Jr., who holds a Master's Degree in Physics, was selected to coordinate the state government program element. Mr. Floro's educational background, experience in engineering, and his varied responsibilities within the military system enable him to deal successfully with problems encountered at the state government level.

The local government element is the responsibility of Douglas Robinson. Mr. Robinson holds a Master's Degree in Public Administration and has work experience in the field of environmental science. This background is useful in coordinating efforts at the local government level.

Technology transfer to the private sector is handled by Robert L. Barnes. Mr. Barnes' previous work experience in industry, coupled with a Master's Degree in Business Administration, provides insight into the special problems encountered in the profit-oriented sector of our economy.

Information retrieval is the responsibility of data librarian Lea Davis. Ms. Davis conducts computerized searches of NASA/RECON and other bibliographic databases in order to obtain references pertaining to the information needs presented to transfer agents by the clients. Ms. Davis' Master's Degree in Library Science enables STAP to serve clients better by more fully utilizing the resources of the University of Kentucky library system.

For support services, the program has a formal agreement with the College of Engineering that provides for periodic assistance and technical consultations which facilitate the



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application of NASA and related technology. In addition, the program staff is assisted in the private sector technology transfer effort by the Center for Business Development, Office for Research, College of Business and Economics.

NASA/UK STAP also employs several graduate students in Public Administration and Business Administration to assist in the day-to-day operations of the program.

## Operational Strategy

The technology dissemination strategy of NASA/UK STAP is to utilize technology transfer agents to interact with public and private sector clients to identify possible technology utilization areas, operational problems, or informational needs. This strategy is a recognition that organizations often experience difficulty in acquiring and sustaining the necessary technical personnel to deal with typical business and governmental problems. Moreover, this approach recognizes that technology is rapidly changing and that it is difficult to be knowledgeable about the latest technologies. Therefore, it is often desirable for managers and researchers to obtain information concerning the latest technologies. The technology transfer services provided by this program help to accommodate this need by providing managers and researchers with an access to the latest technology and its application. Figure 1 describes the basic technology dissemination process.

As shown, when a request is received, a transfer agent visits an organization, reviews and analyzes the problem, researches state-of-the-art information and, when appropriate, recommends research results and strategies that may lead to the eventual solution of the problem. Information is obtained from various resources such as:

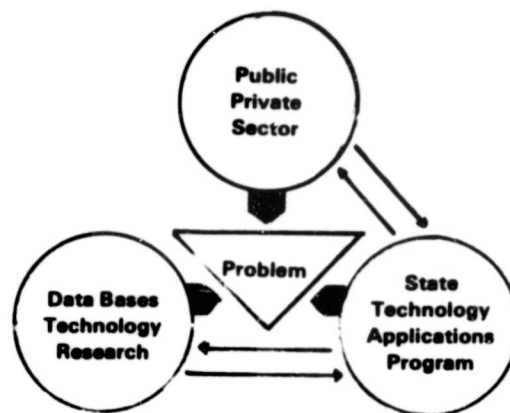


Figure 1.

- On-line commercial and government database systems such as NASA/RECON, DOE/RECON, Lockheed/DIALOG, SDC/ORBIT, and others.
- NASA field centers and technology application teams.
- The Federal Laboratory Consortium for Technology Transfer.
- The technology transfer activities of numerous departments and agencies of the federal government.
- Trade and professional associations.
- Public technology transfer programs and innovation groups.
- Ongoing university research efforts.
- Existing literature available through the University of Kentucky library system.

In addition, the transfer agent may meet with other University of Kentucky specialists to further define the problem or interpret the research results. Each effort is tailored to the specific needs of the client; the type of assistance varies with the complexity of the problem and the clients' capabilities. The diversity of these needs has cast NASA/UK STAP in various roles—as an information dissemination center, a link with subject expertise, referral center, a library research unit, and a document delivery service.

Any local and state government, nonprofit organization, or other public entity is eligible for the technology transfer service. In addition, industry-wide technical problems with broad economic ramifications for the state are also considered to be within the public sector. Thus, industrial associations or other organizations representing several companies are eligible for the same STAP services as governmental units.

Private industry and business are accorded the same service and assistance as public sector clients. STAP personnel work with private clients in problem identification and clarification, serving as an interface between the client and available resources to provide meaningful information for solving the problem.

The decision to implement or act on any recommendation rests solely with the established management of the organization or activity being assisted.



# Outreach Activities

In addition to the day-to-day transfer of scientific and technical information, NASA/UK STAP personnel are involved in many activities that yield direct benefits to clients and to the state. Since its organization in February 1977, program personnel have regularly participated in conferences and seminars throughout the country. These meetings have kept STAP personnel aware of new technology, as well as the latest innovations and developments in the field of technology transfer that will aid in responding to the needs of Kentuckians.

In order to gain insight into state and local problems and to take advantage of person-to-person discussions with public officials, STAP management and agents have participated in conferences and workshops sponsored by such groups as the Kentucky Municipal League, the Kentucky Department of Local Government, and the Governor's Annual Local Government Issues Conference. These meetings have been valuable in identifying common problems and have permitted the staff to effectively assist local governments in determining problem-solving strategies.

The STAP data librarian has been involved in several seminars and workshops dealing with technology transfer. The American Society for Information Science Conferences dealt with new processes of acquiring, storing, retrieving, and disseminating information, using the capabilities of both automated systems and printed reference tools. In addition, attendance at training workshops given by various commercial and government database producers offers opportunities to improve the quality of on-line information retrieval.

Attendance of STAP personnel at the 1978 Conference of the American Society for Public Administration and the Federal Laboratory Consortium Meeting provided program staff with access to the latest concepts on the use of technology transfer and provided for professional development. In addition, the sessions allowed for interaction with repre-

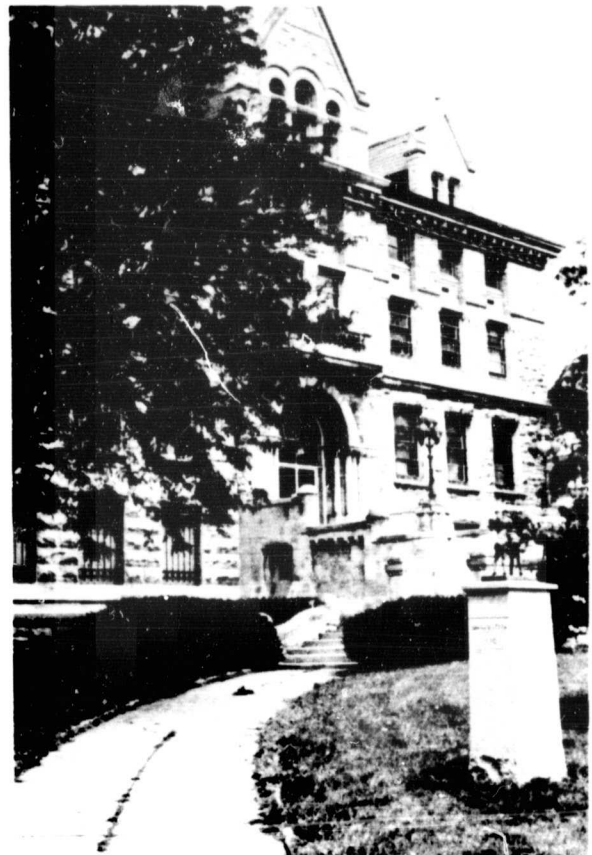
sentatives of other public technology transfer programs.

NASA/UK STAP has participated in other seminars and workshops dealing with a wide variety of subject matters applicable to business, industry, and government. Some of these are:

- The University of Kentucky Seminar on Energy
- Oak Ridge National Laboratory Workshop
- Energy Management Workshop, Blacksburg, Virginia
- University Public Service and Research Association Meeting
- Lockheed User Update Workshops

As part of the ongoing University of Kentucky Public Speaker Program, STAP personnel have met with several civic, governmental, and industrial groups. The purpose of the talks has been to inform the people of Kentucky about the STAP program. Presentations have been given to such groups as:

- Chamber of Commerce, Paris, Kentucky
- International Sales and Marketing Executive Club of Lexington, Kentucky
- Airport Managers of Kentucky
- Community Action Agencies of Kentucky
- Civitan Club of Winchester, Kentucky
- Kentucky Cooperative Extension Service
- Special Libraries Association, Kentucky Chapter



# Program Achievements

During the first program year, the NASA/UK STAP staff contacted 366 organizations which resulted in 393 requests for information and/or assistance (see Operational Statistics). More important, the program became recognized as a valuable source for scientific and technical information for both public and private organizations in Kentucky. The success of the program has been proven by the significant number of organizations that continued to contact STAP for assistance after the initial interaction.

The following are examples of successful transfers and applications of scientific and technical information that have benefited the people of the Commonwealth of Kentucky.

## Local Government

- The Bluegrass Area Development District (a regional planning agency) integrated research information and data supplied by NASA/UK STAP into a solid waste collection study for a rural county. Staff members at the agency found the information provided to be "extremely useful" and easily accessible. The county involved is now enjoying an improved bulk container collection system.
- An inquiry was received by STAP from the city of Paris, Kentucky, concerning refuse collection vehicles. The City Manager requested comparative data regarding engine type, chassis specifications, and packer type. The data provided by STAP enabled the city to purchase a vehicle that matched its needs.

- The Purchase Area Development District had an urgent need for information about a unique multimode transportation problem. Working under a time constraint, STAP was able to quickly provide pertinent data information and documentation. This information was presented at a hearing by the Area Development District, which utilized the program's report to support their position.
- The Planning Director of Maysville, Kentucky (population 8,000) wanted to investigate various techniques that would enable the city to undertake a single survey to determine older homes to be designated as historic, while also yielding information that would help determine the condition of each house. Research information provided by the technology transfer program enabled the Planning Director to establish guidelines for evaluating housing throughout the city and was instrumental in aiding the implementation of the survey.

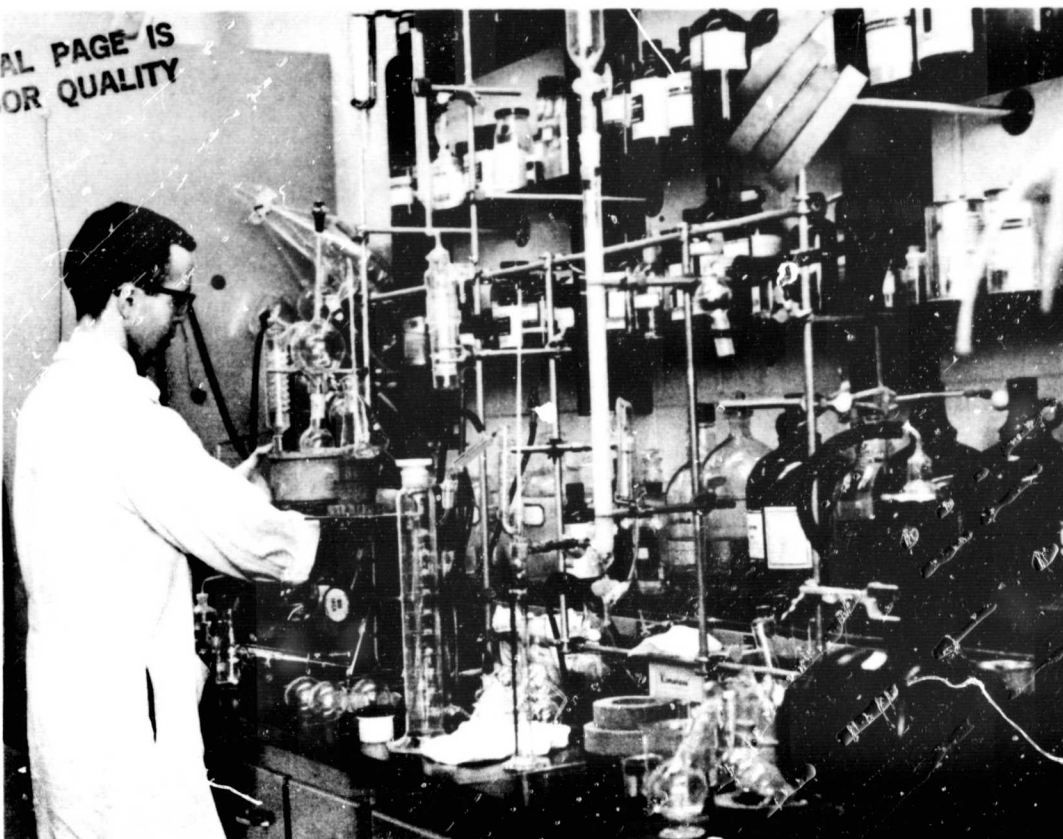
## State Government

- The Kentucky Department of Transportation, Division of Aeronautics, requested state-of-the-art information concerning airport runway paint, asphalt sealer, and runway lightning-grounding systems. STAP researched pertinent information resources and provided technical material that will be of considerable benefit in future airport development activities within the Commonwealth.
- The Kentucky Council for Higher Education expressed



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a need for literature concerning the articulation and transfer of academic credits. Database research enabled NASA/UK STAP to provide information that was utilized in preparing a grant proposal. The grant will aid in the development of procedures within the Commonwealth to insure the appropriate transfer of credits in the state's higher education system.

### Industry and Business

NASA/UK STAP provides an important boost to Kentucky's economy. Working statewide with industry and business, the program improves decision making, increases productivity, and saves research and development time, thus helping insure the steady and productive growth of the Commonwealth's economy.

- The Kentucky Department of Agriculture requested that STAP obtain information concerning the preparation of rice for the state's schools. Research results and recipes were provided that helped cooks prepare attractive, palatable rice dishes. These dishes were more pleasing to the students and, at the same time, provided necessary nutritional values.
- The Industrial Development Finance Authority of the Kentucky Department of Commerce asked NASA/UK STAP to obtain information necessary for conducting a statewide market feasibility study. A comprehensive search was completed and the exact information needed was provided, saving many man-hours of searching for data that was previously thought to be unavailable. The material provided will significantly enhance the program of attracting new industry and business to the Commonwealth.
- Reynolds Supply, a major ground water/water well enterprise, utilized STAP to obtain LANDSAT images and other pertinent information to improve the capabilities of their operation. The company commented that the data gathered from the LANDSAT image was most important in understanding previously unknown geomorphic features in relation to ground water availability. The particular service provided by STAP resulted in a saving of over 500 hours of research time and field work by the company.
- A major manufacturing concern in Kentucky, which requested NASA/UK STAP to provide information on a possible new product line, has commented:  
*We are impressed with a very thorough effort on your part. We will not hesitate to utilize your service at the next opportunity and will also make more people aware of what your program can provide.*

- NASA/UK STAP, working in conjunction with the University of Kentucky Center for Business Development, assisted in the establishment of a cellulose insulation production facility in Springfield, Kentucky. The firm, presently doing business as All-Weather Insulation, requested technical information regarding specifications for the manufacture of cellulose insulation, which STAP provided. With an initial investment of \$170,000, the firm is now in operation, plans to expand production in the near future, and anticipates revenues of over \$400,000 in 1979.
- A Kentucky engineering firm made the following remarks about STAP services:

*We frequently have a need for comprehensive and quick information on diverse subjects. We have utilized the STAP services on several occasions, and as a result have been able to accomplish our work with confidence and completeness.*

## Operational Statistics

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### Financial Report

Financial support for the establishment of NASA/UK STAP was made possible by a joint contractual agreement between NASA and the University of Kentucky Research Foundation (UKRF). Terms of the agreement stipulated that NASA contribute a maximum of \$175,000 in federal funds to defray personnel costs, and that the University of Kentucky provide up to \$60,000 of direct funds and up to \$115,000 of indirect and in-kind funds to match NASA's contributions. Through subsequent negotiations and correspondence, it was determined that the University of Kentucky funds were to be expended in defraying support and other personnel costs. The

### Operational Statistics

#### Contacts

Local Government	130
State Government	94
Industry and Business	<u>142</u>
Total	366

#### Searches

Local Government	99
State Government	163
Industry and Business	<u>131</u>
Total	393

#### Documents Ordered

182

#### Searches by Subject Area

Agriculture/Earth Science	20
Environment/Natural Resources	44
Medical/Biological Science	33
Engineering/Physical Science	118
Management/Administration	40
Human Resources/Education	29
Business/Economics/Planning	59
Public Safety/Transportation	28
Other	<u>22</u>
Total	393

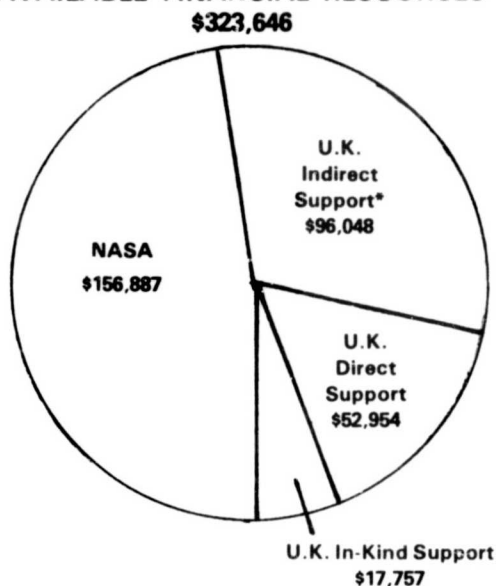


original contract period, February 1, 1977 through January 31, 1978, was extended five months through June 30, 1978.

A total of \$323,646 was spent for NASA/UK STAP from February 1, 1977 through June 30, 1978. STAP operational efficiencies and management practices combined with normal delays in initial staffing allowed expenditures to be held at this level. As shown in the following financial charts, NASA contributed \$156,887 and the University of Kentucky contributed \$166,759 during this 17 month period.

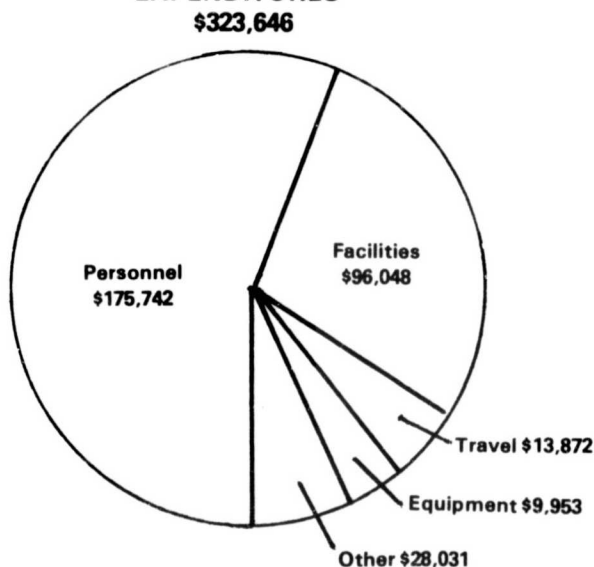
Additionally, an income and expenditure account was established for STAP. It has been used as a flow-through account for income and expenditures for data services. A total of \$539 was received and expended. This figure, however, is not reflected in the financial graphs because it was of a relatively insignificant amount. In the future, NASA/UK STAP will be able to use this account for income generated from service fees that may be charged to clients.

#### AVAILABLE FINANCIAL RESOURCES



\*Indirect support was calculated at a rate of 57 percent (2/1/77 - 6/30/77) and 60 percent (7/1/77 - 6/30/78) of wages and salaries excluding fringe benefits.

#### EXPENDITURES\*



\*Personnel expenditures were supported in the following manner: \$156,887 NASA Funds; \$2,870 UK Direct Funds; \$15,985 UK In-Kind Funds. Facilities expenditures were supported by UK Indirect Funds. All other expenditures were supported by UK Direct Funds. "Other" expenditures of \$28,031 comprise expenses for supplies, telephone, printing, duplicating, computer rental, postage, and subscriptions.



# Future Directions

Based on the first year's activities and achievements of NASA/UK STAP, certain future directions and goals seem appropriate. Specifically within the new program year, STAP will strive to accomplish the following objectives:

- Monitor program direction more closely, through the development of a program evaluation methodology. An ongoing evaluation will enable STAP to better determine the effectiveness of the program and to measure its impact within the Commonwealth.
- Penetrate, in greater depth, the industrialized urban areas of the state by expansion of the program's staff and location of personnel in Louisville, Kentucky.
- Develop closer ties with Kentucky community colleges to facilitate the technology transfer process. If this particular experience proves successful, a more systematic plan would be formulated to include community colleges in a technology transfer effort.
- Develop, for the purpose of information exchange, stronger ties with other universities, especially those actively involved in the areas of public service, technical assistance, and technology transfer.
- Stimulate and promote the use of scientific and technical information in the decision-making processes within the executive branch of state government.
- Increase the present capabilities of the program in the field of energy, especially in terms of staff expertise and in-house resources.



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